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## Section 14

# FISHERIES AND WATER-RELATED WILDLIFE

This section describes the basin's fish and wildlife resources, discusses existing and potential needs, and presents recommendations.

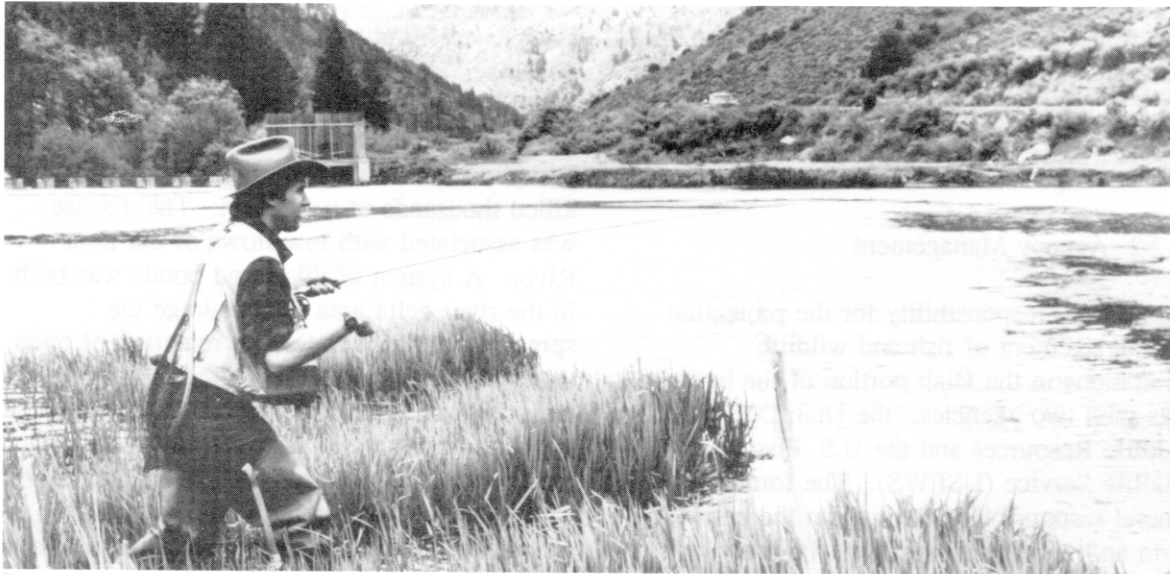
### 14.1 INTRODUCTION

The basin has many important wildlife resources. The Bear River Migratory Bird Refuge has national significance, and the state operates several waterfowl and wildlife management areas. Large herds of deer and elk are present, as well as moose and antelope. The basin contains a substantial portion of Utah's Class I trout fisheries<sup>1</sup>, significant reaches of Class II streams, and a unique fishery in Bear Lake. Many raptors,

shorebirds, wading birds, song birds, small mammals, and other nongame wildlife species are present and enjoyed by people in the basin.

### 14.2 SETTING

The Bear River Basin provides unusually good habitat for a wide variety of wildlife and fish because of its large areas of forest, high mountain valleys, deep canyons, and clear mountain streams lakes and a large river delta. As an indication of the extent of fish and wildlife habitat, more than half of the total basin is covered with mountain-type vegetation (See Table 3-1).



Blacksmith Fork - Div. of Wildlife Resources

#### 14.2.1 Varieties of Fish and Wildlife

Principal game fish found in the mountain streams, lakes, and reservoirs are several species of trout, mountain whitefish, kokanee salmon, channel catfish, black crappie, bass, yellow perch, and walleye. Other fish species present include bullhead, carp, Utah chub, Utah sucker, mountain sucker, and numerous dace and minnows. Four unique species native to Bear Lake are the Bonneville Cisco, the Bonneville Whitefish, the Bear Lake Whitefish, and the Bear Lake Sculpin.

Terrestrial habitat provides for big game such as deer, elk, moose, and pronghorn antelope; upland game such as pheasants, chukars, Hungarian partridge, sage grouse, forest grouse, doves, and rabbits; fur bearers such as beaver and muskrat; and many species of nongame wildlife, including several endangered species. Non-game wildlife includes raptors, shore birds, wading birds, song birds, and many small mammal species. More than 100,000 acres of marshland area and another 100,000 acres of open water provide habitat for nesting, staging, and wintering. The area is of hemispheric importance for waterbirds, and provides year-long habitat for numerous other birds and animals. The habitat includes public and private land. A more detailed inventory of species will be completed when site-specific studies are finished.

#### 14.2.2 Agency Management

Primary responsibility for the protection and management of fish and wildlife populations in the Utah portion of the basin rests with two agencies: the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service (USFWS). The former has general responsibility throughout the entire basin and manages several special areas described in following paragraphs. These special areas cover approximately 40,000 acres. The second agency manages a major national waterfowl refuge, described and discussed

later, and administers the requirements of federal acts relating to fish and wildlife, such as the Endangered Species Act of 1973.

Much of the basin's fish and wildlife are within national forest and public domain land, managed by the U.S. Forest Service and the U.S. Bureau of Land Management. The Forest Service area is 461,000 acres, and the BLM area is 187,000 acres, or about 30 percent of the entire basin (See Figure 7-1). The Utah Division of State Lands and Forestry also manages approximately 80,000 acres of scattered land tracts in the basin, some of which support fish and wildlife populations.

#### 14.2.3 Special Management Areas

Several important refuges and other facilities for wildlife are located in the study area. The larger areas are described below. The existence of Bear Lake National Wildlife Refuge north of Bear Lake in Idaho is recognized. It is not discussed here, however, because this report is primarily concerned with Utah.

Bear River Migratory Bird Refuge - The Bear River Migratory Bird Refuge was developed in 1928 by the U.S. Fish and Wildlife Service (USFWS) to improve the existing natural habitat, and to alleviate periodic outbreaks of botulism which had killed thousands of waterfowl. The disease was associated with low flows of the Bear River. A system of dikes and ponds was built in the river delta area to encourage the spreading of fresh water and retention of open water surfaces, especially during low flow periods. Maintaining of adequate flow to these ponds is important to their effectiveness. Many thousands of birds use the refuge daily. The refuge area is regularly visited by 268 species of birds, 68 of which are known to nest there.<sup>1</sup> The refuge is considered to be of continental importance for waterfowl and non-game migrating species. It is the earliest designated waterfowl refuge in the United



West of Brigham City - Div. of Wildlife Resources

States, and is one of the largest. The USFWS has continued to operate and improve the refuge since its development.

The present refuge area covers about 65,000 acres, including 27,000 acres within five diked areas (units), 7,600 acres below the diked areas, and 30,400 acres above the five units. Most of this 30,400-acre area is in the northwest corner of the refuge (See Figure 14-1). Regulation of freshwater inflows to the ponds, and releases from them, were accomplished by a system of canals and control structures. A refuge headquarters, with about 10 buildings and a landing strip, was built near the extreme terminus of Bear River's old natural channel. A 14-mile road from Brigham City provided access to the refuge headquarters. The refuge headquarter facilities and much of the access road were destroyed by record-high levels of Great Salt Lake in the 1980s (See Section 14.3.2).

State-Managed Waterfowl Areas - The Utah Division of Wildlife Resources operates

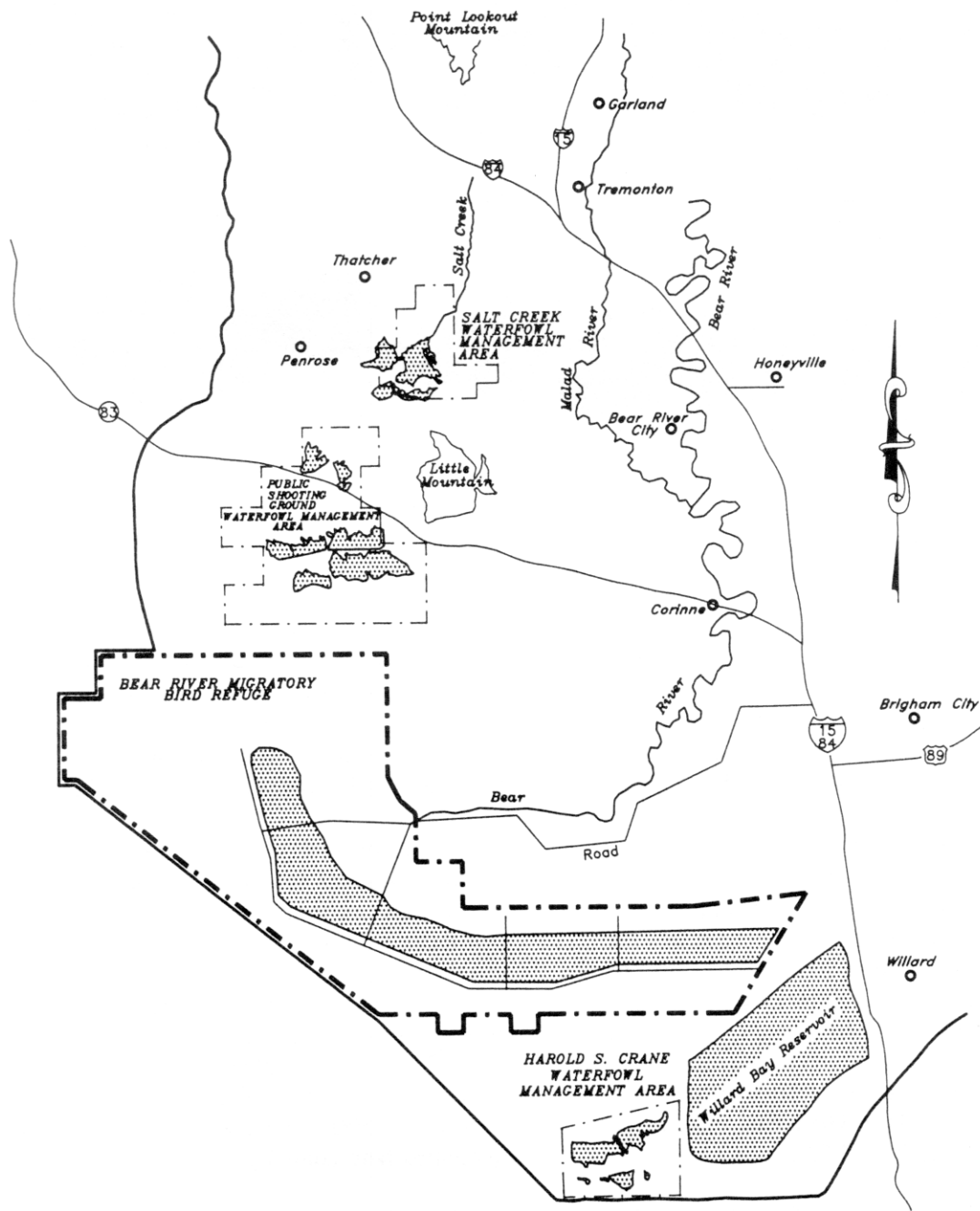
three waterfowl management areas in Box Elder County: Salt Creek, Public Shooting Grounds, and Harold S. Crane. These three, with a combined area of nearly 27,000 acres, along with about 50,000 acres of privately-owned marshland surrounding the federal refuge (including West Bear River and Willard Spur Bays), are extremely important for migratory birds. The value of these marshlands is inter-related with the refuge.

As shown on Figure 14-1, the Public Shooting Grounds Waterfowl Management Area is adjacent to the Bear River Migratory Bird Refuge on the north. The management area comprises about 13,000 acres<sup>8</sup>, and includes nine lakes which are fed by several small streams and springs. Three of the four largest lakes are controlled by dikes. Outflows discharge into the federal bird refuge. An average of 6,500 ducks and geese are harvested by hunters here annually.

The Salt Creek Waterfowl Management Area, immediately northeast of the Public

FIGURE 14-1

MANAGED WATERFOWL AREAS  
EASTERN BOX ELDER COUNTY



Shooting Grounds, covers about 5,000 acres.<sup>8</sup> Several lakes or ponds within this area are fed by Salt Creek, springs, and return flow from irrigated land. The estimated annual hunter harvest is 8,000 ducks and geese.

The Harold S. Crane Waterfowl Management Area of about 8,600 acres<sup>8</sup> is situated southwest of Willard Bay Reservoir. The water supply for this area consists of releases from Willard Bay Reservoir, Weber River Basin springs, and return flows.

Private Waterfowl Areas - A combined area of 19,500 acres southwest of Corinne is managed by nine private duck clubs to provide habitat and hunting for their members. The specific clubs and areas are listed in Table 6-7.

Hardware Ranch Wildlife Management Area - In Cache County, the Utah Division of Wildlife Resources operates the Hardware Ranch Wildlife Management Area. This area of 19,000 acres,<sup>1</sup> located in Blacksmith Fork Canyon, provides winter feeding to more than 400 elk between December and March each year. Summer feeding range is adequate for elk and other big game in the basin, but winter range is not. The feeding program allows a continued existence for this herd, which otherwise might migrate toward valley agricultural lands. This area is also operated for the management of deer and other big game, and to provide public fishing access on the Blacksmith Fork and several tributaries.

#### 14.2.4 Other Wildlife Habitat

Other significant water-related habitat includes the river itself, tributaries, reservoirs, lakes, marshland, wet meadows, other irrigated land, and big game winter habitat. Each of these habitat types occupies large areas of the basin, or many river miles, and supports great numbers and varieties of birds, mammals, fish, amphibians, mollusks, and other aquatic species. Although much of the total habitat is

public land, half or more is probably privately-owned (See Figure 7-1).

In Cache County, the primary waterfowl habitat is on Cutler Reservoir and the adjacent marsh area. About 2,010 acres of bulrush and cattail and 2,220 acres of upland marsh plants are associated with the open water on this reservoir. Waterfowl hunter use in Cache County averages 13,300 hunter days, with a harvest of about 22,000 birds annually. The major part of this hunting activity occurs on Cutler Reservoir and surrounding waterfowl areas. Other hunting occurs on the various rivers and streams in the area. Several important rookeries exist within this area, including snowy and cattle egrets, great blue and black-crowned night herons, and white faced ibis. Local and regional recreationists spend numerous hours observing birds and other wildlife in this area.

The waterfowl habitat in Rich County supports breeding of 75 to 100 nesting pairs of Canada geese and several hundred ducks. This is also a staging area for Greater Sandhill Cranes during spring and fall migrations. Counts show nearly 1,000 cranes use the marshes along Bear River each fall. About 50 pairs of these cranes remain to nest in the area. Another important waterfowl area is Neponset Reservoir, with 1,043 acres. It is used by 20 to 30 pairs of nesting Canada geese. Hundreds of geese come to the area to molt each year. Several hundred ducks are also produced on the area. Round Valley, south of Bear Lake, contains 2,000 acres of waterfowl habitat which produces and supports good numbers of waterfowl and a few cranes. The area also provides hunting.<sup>1</sup>

The deer is the most numerous big game animal. Summer range is ample for these animals. Winter range, which is the key to overall carrying capacity, is in short supply. Four deer herd management units are within the basin. Winter range areas on these units is shown in Table 14-1, according to area

available in normal winters and in critical winters, which is a constricted portion of the normal winter range. A portion of Blacks Fork Unit in Summit County within the basin has no deer winter range, because deer migrate south and east to winter. A small area in eastern Box Elder County lies within the basin, but it contains no significant winter range. An

Lake), provide quality fishing opportunities. Some of the state's finest cold-water stream fisheries occur in lower Bear River Basin tributaries. In Cache County, 7.0 miles of the Logan River and 15.2 miles of the Blacksmith Fork River are Class I trout fisheries, which together represent 29.8 percent of the total miles of Class I stream fisheries in the state.

**TABLE 14-1**  
**DEER WINTER RANGE IN BEAR RIVER BASIN<sup>1</sup>**

Deer Herd Unit	Normal Winter Range	Critical Winter Range
	(acres)	
Unit 2 - Cache	186,957	50,200
Unit 3 - Mantua, Willard	25,366	8,928
Unit 4 - Wellsville	23,906	9,141
Unit 5 - Woodruff	143,466	24,460

important winter range for moose is located on the upper Bear River within Utah and Wyoming. The area used by moose extends about three miles on either side of the Utah-Wyoming state line, mainly along the drainages. Moose move into the extensive willow-bottoms found along the streams to winter, and snow depth does not seem to seriously hamper their movement. They prefer a species of willow, identified as Drummond's willow, which is prevalent along the water courses in this area. The number of moose is growing, and they are increasingly seen in Cache and Rich County.<sup>1</sup> Antelope are often seen in the open sagebrush areas of the upper basin above Bear Lake.

#### 14.2.5 Fisheries

Cold Water Fisheries - In the Utah portion of the Bear River Basin, an estimated 455 miles of stream length are classified as cold-water fisheries. Cold-water lakes, with about 50,000 surface acres (including Bear

Another 44.0 miles of Class II streams in Cache County are on the Logan River, Blacksmith Fork, Left Hand Fork of Blacks Fork, Little Bear River, and East Fork of Little Bear River. Class III stream fisheries are found throughout the basin in Box Elder (67.8 miles), Cache (193.2 miles) and Rich (134.3 miles) counties. Also, all of these stream complexes contain a complement of natural cold-water nongame fish species and amphibians that provide genetic and species diversity.

Warm Water Fisheries - The Bear River Basin in Utah has 160 stream-miles of warm-water fishery, and 7,460 surface acres. By the time the Bear River re-enters Utah in the north end of Cache County, water quality has been degraded to the point that a cold-water fishery is not supported, and a limited-value Class IV fishery for warm-water species exists. Although water releases from Cutler Dam fluctuate considerably, the Bear River downstream from Cutler Dam improves



to a Class III fishery, supporting populations of channel catfish, black bullhead, largemouth bass, and occasional cold-water game species.

Flat Water Fisheries - Flatwater fisheries in the lower basin include warm-water fisheries in Cutler Reservoir, Hyrum Reservoir, Newton Reservoir, Mantua Reservoir, and cold-water fisheries in Porcupine Reservoir, Wellsville reservoir, and Bear Lake. Several small, high mountain lakes in the Wasatch National Forest also provide cold-water fisheries. Water quality in Hyrum, Newton, and Wellsville reservoirs is poor and declining, diminishing the reservoir's capacity to produce trout. Water quality in Bear Lake is good.

#### 14.2.6 Instream Flows

In the larger Bear River Basin streams, some flow is maintained throughout the year. The entire length of Blacksmith Fork River and Logan River are Class I and/or Class II fisheries from their respective headwaters to the canyon mouths, with the exception of small reaches of Blacksmith Fork seasonally dewatered by hydroelectric developments. These rivers are unregulated, with no significant upstream storage or consumptive diversion. They are essentially subject to naturally occurring flows, and they include some of the highest quality trout fisheries in the state.

Recorded minimum flows are listed in Section 5 (See Table 5-2). Records are shown for mainstem and tributary streams, and high and low years. The data are intended to be representative of historical low flows within the study area. Long-term streamflow records show that annual minimums are normally in the winter, but in drought years like 1977 they have occurred in the late summer or early fall. Some of those which went to zero or near zero flows may have been natural, but most probably resulted from upstream storage regulation.

### 14.3 PROBLEMS AND NEEDS

Fish and wildlife professionals perceive the main problems and/or needs in the basin at present are: (1) deteriorated water quality in fishery streams, lakes, and reservoirs (especially Hyrum, Newton, and Mantua reservoirs); (2) restoration of waterfowl habitat damaged by high levels of Great Salt Lake; (3) protection of wetlands and other important habitat; (4) protection and improvement of riparian habitat and streambank stability; (5) maintenance and improvement of instream fishery flows and public access; and (6) cooperative planning and management of existing and future water development for the benefit and protection of fish and wildlife.

#### 14.3.1 Water Quality

Where deteriorating quality occurs, it impairs the existing fishery and affects many bird species. Water quality problems of special concern are in Hyrum, Newton, Cutler, and Mantua reservoirs, and the Bear River and Little Bear River in Cache Valley. Although Bear Lake quality has been improved, and is currently good, continued monitoring and control are needed because of the intense and growing recreational use of the lake. Cutler Reservoir and the Bear River immediately above it could support many more bird species if there were aquatic insects and plants for them to eat. Sediment, nutrient runoff, and pesticides have combined to lower the water quality. If improved, the area could support many more fish-eating birds, ducks, and mammals. In Section 12, water quality problems throughout the basin are discussed in detail.

#### 14.3.2 Bear River Migratory Bird Refuge

Between 1985 and 1988, water damage to refuge facilities was extensive. The Great Salt Lake rose to the highest level ever recorded (4211.85 feet) in 1986 and 1987, completely inundating the refuge area and covering the



dikes with four feet of water. Before the lake dropped to normal levels again in 1989, wave action and ice had destroyed or severely damaged the headquarters buildings, dikes, canals, control structures, roadway, and much of the marsh-type vegetation so important to migratory birds. Section 14.4.2 describes current rehabilitation activities.

In addition to the recent damage, the refuge's effectiveness has always been somewhat impaired by a chronic annual shortage of river flow in the late summer and fall. A water supply to alleviate this deficit would represent a substantial improvement.

#### 14.3.3 Other Important Habitat

Large areas of privately-owned wet meadows in the valleys of all three counties provide important habitat for ibis, snowy egret, sandhill crane, shorebirds, ducks, raptors, and many other species of birds and animals. The loss of any of this habitat would be significant to the above wildlife. Another valuable wildlife resource that would be a significant loss are the warm artesian springs which provide open water habitat during cold winters. These springs could be detrimentally affected by a lowered water table.

Although summer habitat is ample for deer and elk, areas of food supply and protection during winter is a critical limitation. The original, natural winter habitat, the basin's valley areas, is now occupied by cities and towns. As communities grow and expand into bordering foothill areas, the already limited winter habitat for big game is reduced even further. This fact is understandably of great concern to wildlife managers in the Bear River Basin, because the projected population growth indicates that this existing problem may become even more severe.



Hardware Ranch - Div. of Wildlife Resources

#### 14.3.4 Instream Flows and Fishing Access

The advantages of maintaining year-round minimum flows in natural streams in the Bear River Basin are (1) protection of existing fish populations; (2) maintenance of riparian vegetation, which improves streambank stability and resistance to erosion; (3) maintenance of favorable conditions of flow in stream channels; (4) esthetic enjoyment and recreational use by people; and (5) normal daily use by birds and animals.

Water resource development actions in the basin have altered the natural yearly flow patterns of streams. The effect of the changes is a combination of good and bad. Storage and diversion of streamflows for a water supply reduce the natural flow during part of the year, and in several cases, such as Woodruff Creek and the lower end of Blacksmith Fork, the stream is sometimes dewatered. But releases from storage also augment the natural flows

during other times of the year, most often July - September which is normally a low-flow period in the basin because of naturally declining streamflows. Low flows, dewatering, and some changes in seasonal pattern cause difficulties in maintaining a fishery. Not all peak flows are bad for wildlife. Some flooding stimulates and extends riparian systems.

Public access to streams is limited or precluded in some reaches as a result of private ownership. With increased future demand for public fishing opportunities (See Section 15), the available reaches will become more crowded, and the pressures for more public access will increase.

#### 14.3.5 Riparian Vegetation

Riparian vegetation is critical for virtually all wildlife in the basin, as well as amphibians, mollusks, and many other aquatic species. For most of the latter group, there is very little knowledge available. Stream bank stability and resistance to channel scouring are enhanced by healthy riparian communities. Overall responsibility for maintenance, improvement, and restoration does not seem to rest with any one agency or local government. Corrective action is needed where stream banks are deteriorating, but funding for this purpose is often limited.

#### 14.3.6 Future Development

With future population growth, recreational interest in the Bear River is expected to increase. This interest will create more demand for fishing and hunting and watchable wildlife opportunities, and at the same time will put additional pressure on the finite fish and wildlife resources present.

Projected growth in the basin and related nearby metropolitan areas (the Wasatch Front) will require additional development of water supplies. The 1991 Legislature directed that plans for such development proceed. Thus, it

is expected that new reservoirs and other water supply structures will be built. In so doing, there is an accompanying need to minimize any harmful effects on fish and wildlife. Senate Bill 98, passed in general session by the 1991 Legislature, provided (among other things) that Bear River development project costs allocated to fish and wildlife are not reimbursable, and shall be paid entirely by the state (See Section 9).

#### 14.3.7 Bear River Bay

The Bear River arm of Great Salt Lake is a nationally important wetland<sup>2</sup> area. Freshwater inflows to the saline lake create a unique environment that is critical to many species of shorebirds, waterfowl, and other migratory wildlife. The wetland ecosystem is maintained by high flows of freshwater in springtime. Any upstream water development plans should evaluate impacts on the inflow/timing regime to the Bear River Bay.

### 14.4 ALTERNATIVE SOLUTIONS OR ACTIONS

Some of the alternatives suggested for meeting future water needs in northern Utah may conflict with fish and wildlife needs. For instance, the development of a reservoir site may impact portions of highly valued stream fisheries and associated riparian systems. However, some of the needs for fish and wildlife can be met in concert with efforts to stabilize watersheds, improve water quality, and reduce peak flows in some streams. It continues to be important that wildlife planners and water resource planners work cooperatively on projects.

#### 14.4.1 Water Quality

Several different efforts and programs discussed in Section 12 are aimed at improving water quality in the basin. Included are the

Bear Lake Regional Commission's coordination of activities for the improvement of Bear Lake, the program by Utah Department of Environmental Quality and Utah Department of Agriculture to reduce non-point source pollution of the Little Bear River, the public information and education programs maintained by several agencies and organizations to reduce animal waste pollution in the Bear River, watershed improvement plans by the Soil Conservation Service, and the water quality management plan by the Utah Department of Environmental Quality.

#### 14.4.2 Bear River Migratory Bird Refuge

As part of a major rehabilitation program for the damaged bird refuge, the USFWS prepared an environmental assessment<sup>3</sup> which considered four alternatives. The preferred alternative proposed in the assessment is a 38,200-acre expansion of the refuge, combined with restoration and enhancement of the existing refuge. The other alternatives are (1) restoration and enhancement of the existing refuge area, (2) restoration only, and (3) no action. With preliminary internal approval, the USFWS is proceeding with studies to implement the preferred alternative.

Increases in late-season flows to the bird refuge could be provided by building upstream storage reservoirs. Previous studies and interagency discussions extending back to 1953 have resulted in various estimates of water requirements. The most recent are presented by the USFWS in its environmental assessment for the refuge. The amount of water needed varies according to the degree of restoration and enlargement and the future management plan. The assessment indicates the following water requirements for March-November, as compared with median flows in the Bear River near Corinne for 1932-83: (1) preferred alternative (expansion) would require 653,700 acre-feet, including 280,600 acre-feet from presently undeveloped storage; (2) enhancement alternative would require 567,200

acre-feet, including 238,100 acre-feet from new storage; and (3) restoration alternative would require 296,800 acre-feet, including 3,400 acre-feet from storage. Substantial portions of the requirement for the first two alternatives is for flushing the refuge ponds three times a year, in March, August, and November.

Comparisons between these requirements and historical river flows are shown graphically on Figure 14-2. Figure 14-2 shows, for example, that the preferred expansion alternative would require 214,490 acre-feet in August alone. This is a large quantity, about twice the storage content of the proposed Honeyville Reservoir. The effect of these refuge quantities on future M&I and other water requirements has not been determined, but apparently it is substantial.

#### 14.4.3 Instream Flows and Fishing Access

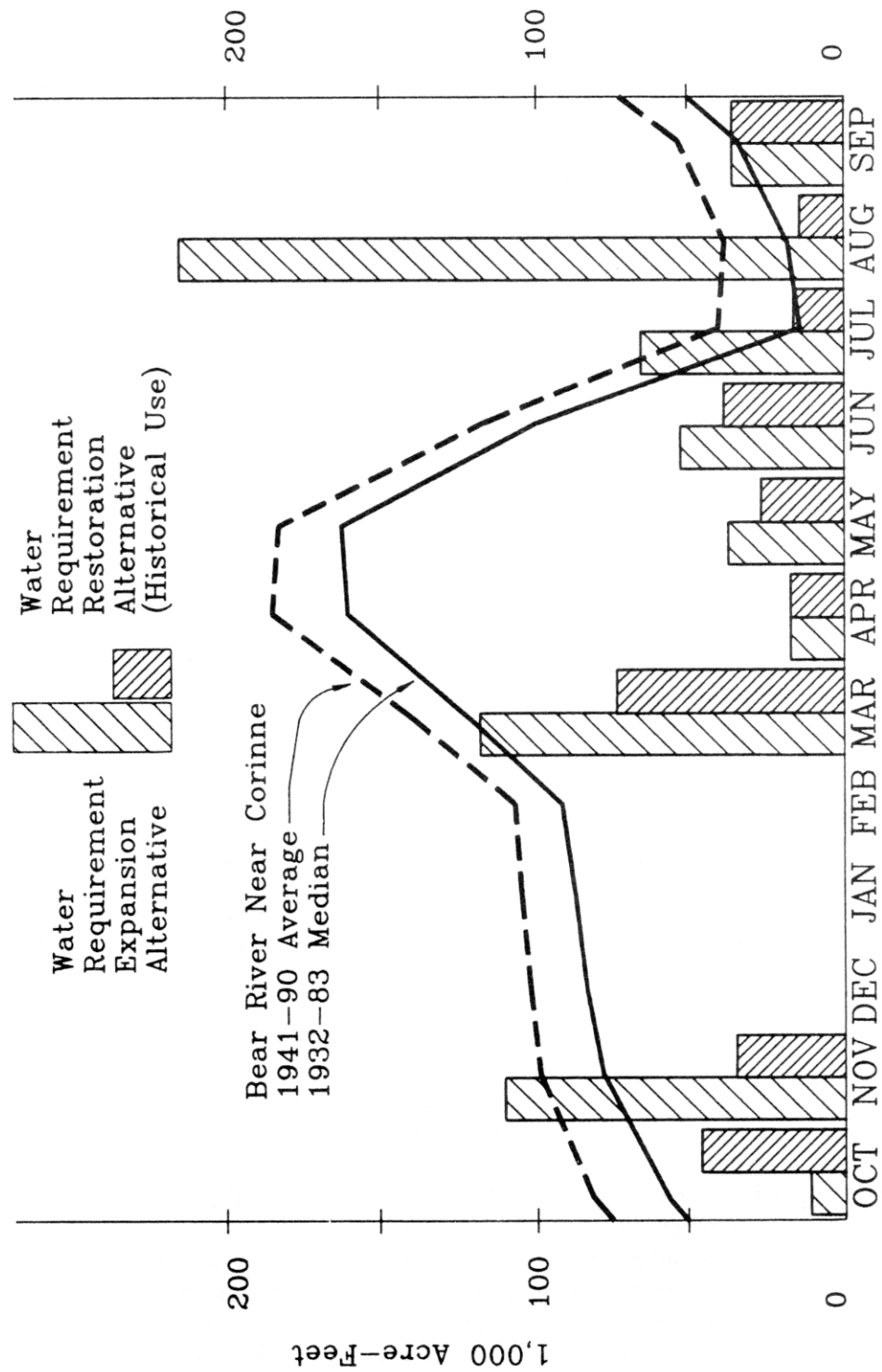
Selected minimum flow requirements that may provide optimum fishery conditions are listed in Table 14-2. These were developed in 1977 by the Division of Wildlife Resources for the Division of Water Resources.<sup>5</sup>

Public access across private land involves several potential difficulties, such as crop damage, littering, interference with livestock, and gates left open. Various innovative solutions to these difficulties have been tried, with various degrees of success. The strongest influence for success is an honest desire among all parties concerned to reach a solution.

#### 14.4.4 Riparian Vegetation

In the interest of public good, there is a need for willing acceptance of responsibility by all concerned, without need for legal compulsion. If each agency, county, city, town, or private landowner directly or indirectly responsible for any portion of any stream would voluntarily restore and improve streambank vegetation whenever an opportunity occurs, the overall result could be significant.

FIGURE 14-2  
 WATER REQUIREMENTS vs. SUPPLY  
 BEAR RIVER MIGRATORY BIRD REFUGE



**TABLE 14-2**  
**MINIMUM FLOW REQUIREMENTS FOR SELECTED STREAMS, BEAR RIVER BASIN**

Stream Location	Flow (cfs)
Bear River in Rich County	130
Logan River	75
Blacksmith Fork River	50
Little Bear River	30
Malad River at mouth	10

#### 14.4.5 Future Development

Experience has shown that issues associated with fish and wildlife values versus water supply development can easily become polarized to a condition of bitter public controversy and lack of progress for either side. To avoid this, experience has also shown that full and early communication, with a desire to cooperate, can lead to a mutually beneficial consensus.

### 14.5 RECOMMENDATIONS

In consideration of the foregoing problems and needs, the following recommendations are offered.

#### 14.5.1 Water Quality Improvement for Fisheries

The Division of Wildlife Resources should continue to work with the Division of Water Quality and others to identify water quality problems in reservoirs and streams which may be limiting to fisheries. Reservoir owners/operators should consider water quality for fisheries and other uses as an integral part of the reservoir operation. Structural solutions may include multilevel reservoir outlet structures to allow water temperature and quality to be adjusted, both in the reservoir and for downstream fishery releases.

#### 14.5.2 Bear River Migratory Bird Refuge

The Fish and Wildlife Service should rehabilitate the refuge, so that it can again serve its purpose. State agencies should cooperate in this effort. The effect of an increased water supply to the refuge should be evaluated by the Division of Water Resources to determine the impacts this large increase in demand would have on other local water needs. The existing water right filing should be clarified by the Division of Water Rights in relation to other water rights.

#### 14.5.3 Instream Flows And Fishing Access

Planning for water projects should incorporate instream flow considerations as part of project operational criteria. New projects should also make provision for adequate public access to fishing streams and other water-based attractions. Existing public access for both fishing and recreation should be maintained and improved as opportunities occur in future years.

#### 14.5.4 Riparian Vegetation Protection

The Department of Natural Resources, other state agencies, and public and private land managers should continue to give special consideration to the protection and management of shoreline vegetation and stream banks in the Bear River Basin. This

recommendation is particularly appropriate in areas owned and managed by state entities and along streams classified as Class I and II fisheries; and (where appropriate) for neotropical migrants, colonial nesting, and endangered species.

#### 14.5.5 Future Development

In planning any new water developments in the basin, the Utah Division of Water Resources or any other planning entity should give consideration to multipurpose use. To adequately provide for these needs, consultation and input from fish and wildlife professionals should continue. Project features for fish and wildlife purposes should be completed concurrently with construction.

#### 14.7 REFERENCES

In addition to the references listed below, attention is directed to Section 14 of the Utah State Water Plan, January 1990, where the values of fish and wildlife to the people of Utah and six related issues are discussed.

1. "Environmental Conditions Inventory," working paper for Bear River Basin Cooperative Study, Appendix I-IV, Utah Division of Water Resources, March 1977.

2. Letter from Assistant Field Supervisor, U.S. Fish and Wildlife Service, Salt Lake City, June 4, 1990.

3. "Restoration and Expansion of Bear River Migratory Bird Refuge," Environmental Assessment, U.S. Fish and Wildlife Service, October 1991.

4. "Bear River Investigations", Status Report, U.S. Bureau of Reclamation, June 1970.

5. "Environmental Enhancement Opportunities," U.S. Dept. of Agriculture, in cooperation with Idaho, Utah, & Wyoming, March 1977.

6. Letter from acting Director, Utah Division of Wildlife Resources, February 16, 1989.

7. Letter from Director, Utah Division of Wildlife Resources, June 7, 1990.

8. Utah Division of Wildlife Resources (8-20-91 telephone conversation with Tom Aldrich, Waterfowl Program Coordinator).

9. "Water-Related Land Use Inventories," Bear River Basin," Utah Division of Water Resources, January 1991.

#### Notes to Pages 14-1 and 14-9

1. Stream classes for fishery use are not equivalent to the stream classes defined in Section 12.
2. In this section, this term is used in the general sense to describe waterfowl habitat, rather than formally designed jurisdictional wetland.